

Interactive comment on “The evolution of AMULSE (Atmospheric Measurements by Ultra-Light Spectrometer) and its interest in atmospheric applications. Results of the Atmospheric Profiles Of Greenhouse gasEs (APOGEE) weather balloon release campaign for satellite retrieval validation” by Lilian Joly et al.

Anonymous Referee #2

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General Comments 1) This paper should be reconsidered after major revisions. 2) There are sections of the paper that focus solely on IASI analysis and then shoehorn in the fact that the analysis was also done with CrIS. It would be beneficial to add more details on the analysis done with CrIS. A couple of the sections that need more information are mentioned in the specific comments. 3) There are many grammatical

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mistakes throughout that need fixing. I compiled a list of the ones I found but there are certainly more. 4) Overall, the structure of the paper is good.

Specific comments 1) Many acronyms are used without being spelled out in the abstract (CNRM, AMULSE, APOGEE, IASI, CrIS, NWP, RRTOV, MOCAGE, CAMS) 2) P8. Figure 2: What does the % of H₂O represent? 3) P11. Line 3: The photosynthesis phenomenon enriching CO₂ should have a reference 3) In section 5.1.3 and 5.2.2, the authors should add more information on CrIS. CrIS seems to be mentioned off hand while all of the analysis is done with IASI. 4) In equation 1 in section 5.1.5 exp should be rewritten as either $\exp(O_3)$ or $O_3 = \ln(\dots)$. The superscript simul could also be shortened to just sim.

Technical corrections P1. Line 5-6: I recommend splitting this into two sentences. Maybe “The plug and play instrument is compact, robust, cost-effective, and autonomous. The instrument also has a low power consumption and is non-intrusive.” P2. Line 7-8: rewrite to “The climate of the earth is currently changing quickly. Recently, evidence has accumulated showing that this climate change is directly related to human activities.” Line 9: change “involve” to “create” Line 10: change “of” to “on” Line 10: remove “on Earth” Line 20: remove “the” before CH₄ Line 22: change “many informations” to “information” Line 25: Define the RRTOV acronym P4. Line 26: change “meters” to “meters” Line 27: change “lots of preparations” to “a lot of preparation” P5. Line 2: change “This specificity of the balloons, to be able to access the profiles,” to “The balloons’ ability to access the profiles” P6. Line 9: close the parentheses Line 10: change “The spectrometer weights is lower than” to “The spectrometer weighs less than” Line 13: change “send various datas” to “sends various data” Line 14: computer fixed 400m in relation to what? Line 15: capitalize AMULSE Line 23: change “at” to “a” change “about” to “for” Line 25: capitalize AMULSE P7. Figure 1: capitalize AMULSE, remove “of (a) CO₂,(b) CH₄ and (c) H₂O” P9. Line 3: replace “the” with “our” Line 9: change “balloon” to “balloons” Line 10: add period at the need of this sentence Line 18: change “Balloon” to “The balloon” Line 20: change “Balloon” to “The balloon” Line 20:

change “cutted” to “cut” Line 29: make hypothesis plural P11. Move the table 2 caption down a line Line 6-7: change “prospects for 2020 is to make water vapour measurements by laser diode spectrometry to have a better accuracy” to “goals for 2020 is to make water vapour measurements by laser diode spectrometry more accurate” P12. Line 6: change “a prior” to “a priori” P13. Line 15,19,20, and 21: Either use commas or no separation between the thousand and hundred place in numbers instead of decimal points. (i.e. 1,000 or 1000) P16. Need to fix decimal points on this page as well. Line 4 and 5: what does “rp” mean Why did CO₂ and CH₄ become italicized midway through this page P17. Figure 9: If “,rp” stands for reference profiles you need a better way of conveying this Line 5: add “to” between “CO₂” and “have”

P18. Line 8: change “validate to “verify” and remove “essentially” P19. Line 5: Remove “of the” P20. Line 13: add space to “beretrieved” Line 14: change “. Which” to “, which” Line 25: Remove “of” add the start of the sentence. I do not think “restitutions” is the right word here. P22. Last 2 lines: Remove italics on chemical names P23. Figure 12 panel d: change “radiosondage” to “radiosonde”

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